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Texas Strategic Highway Safety Plan (SHSP)



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INTRODUCTION

Texas SHSP Mission

The mission of the Texas Strategic Highway Safety Plan (SHSP) is to reduce the human and societal costs of highway traffic crashes, deaths, and injuries by most effectively implementing the “4 E’s” of traffic safety - engineering improvements, traffic law enforcement, public education, and emergency medical services (EMS).

Background

Section 1401 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires each state to develop and implement a Strategic Highway Safety Plan (SHSP). The purpose of the SHSP is to identify key safety needs and guide investment decisions to achieve significant reductions in highway fatalities and serious injuries on all public roads. SAFETEA-LU requires that each state have a SHSP signed and in place by October 1, 2007 in order to receive a fully apportioned share of federally allocated Highway Safety Improvement Program (HSIP) funds.

The Texas Department of Transportation (TxDOT) is leading the effort to develop the State’s safety plan. The Texas SHSP builds on existing safety programs and provides a comprehensive framework for data driven decision-making. Further, the Texas SHSP establishes statewide goals, objectives, and key emphasis areas in consultation with Federal, State, local, and private sector safety stakeholders.

Where We Are

State and Fatality Analysis Reporting System (FARS) crash data, along with travel and population data were used to provide estimates of various measures of traffic safety. Fatalities and fatality rate per million vehicle-miles traveled (100M VMT) and per one hundred thousand population (100K pop.) were computed for the state for the years 1995 through 2004. Serious injuries (A-incapacitating and B-non-incapacitating) and injury rates (including fatalities) were computed for the years 1995 through 2001. This data is presented in Table 1.

Table 1. Summary of Texas Crash Trends, 1995 – 2004

	Year									
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Fatalities	3,172	3,738	3,508	3,576	3,519	3,775	3,739	3,823	3,821	3,699
Rate per 100M VMT	1.75	1.97	1.79	1.76	1.69	1.76	1.77	1.77	1.75	1.61
Rate per 100K Pop.	16.94	19.54	18.05	18.10	17.56	18.10	17.65	17.76	17.48	16.14
Serious injuries*	103,310	110,751	109,351	106,578	107,996	108,282	105,520	N/A	N/A	N/A
Serious injury rate per 100M VMT	57.02	58.39	55.72	52.34	51.95	50.41	49.87	N/A	N/A	N/A
Serious injury rate per 100K Pop.	551.75	578.99	562.52	539.37	538.79	519.29	498.12	N/A	N/A	N/A

Notes: * Includes incapacitating and non-incapacitating injuries. N/A = not available

Sources: 1995 – 2001 fatality and injury data from Texas Department of Public Safety, *Texas Traffic Crash Database*. 2002-2004 fatality data from FARS. Travel data Texas Department of Transportation. Population data from Texas State Data Center.

Where We Would Like to Be

Although fatalities and serious injuries have declined since 1996, the general consensus among those involved in transportation safety is that further reductions are not only desirable, but feasible. Technological improvements in automobile and roadway engineering, enforcement methods, medical treatment and in educational processes suggest we have not reached the limits of our capabilities in reducing crashes and injuries. Strategic planning to enable these reductions, however, requires that a target goal be established. This is never an easy task because the goal must be practical enough to have the possibility of being achieved yet lofty enough to present a challenge to the transportation safety community. Currently, the target goal for Texas is 1.50 fatalities and 41.2 serious injuries per 100 million VMT by 2010.

Overall State Goal: 1.50 fatalities and 41.2 serious injuries per 100M VMT by 2010.

The planning process used to identify emphasis areas where significant crash reductions might be achieved and to identify countermeasures for achieving those reductions are described in the following sections. It is anticipated that implementation of this plan, with iterative revisions and updating, will assist in reaching the target goal by reducing crash experience in the identified emphasis areas.

Approach to Strategic Planning

Several steps were undertaken during the initial development of the working draft of the Texas SHSP. First, five years of the most recent (1997-2001) crash data were analyzed to identify transportation safety issues facing Texas. Using fatalities (K) and incapacitating (A) and non-incapacitating (B) injuries weighted by economic loss, **forty key crash categories** were identified (see Attachment 1). These key crash categories were used to develop key emphasis areas. This analysis accounted for more than 60 percent of the average annual economic loss due to serious crashes in the state.

Second, countermeasures to address the key emphasis areas were identified and used in the development of a stakeholder survey. The survey was sent to federal, state, and local safety stakeholders and other highway safety professionals with experience and knowledge in the engineering, education, enforcement, and EMS areas (see Attachment 2). Stakeholders rated the effectiveness of 34 highway safety countermeasures and assessed how well Texas is doing in applying each of the countermeasures.

Third, transportation safety professionals and stakeholders were asked, both informally and in a workshop setting, to review the initial emphasis areas, countermeasures and objectives. This process, coupled with a review of information from other states, the Federal Highway Administration (FHWA), National Highway Traffic Safety Administration (NHTSA), Transportation Research Board (TRB), and the American Association of State Highway Transportation Officials (AASHTO), helped identify areas of additional concern, identify additional countermeasures and establish manageable objectives to be achieved by countermeasure implementation.

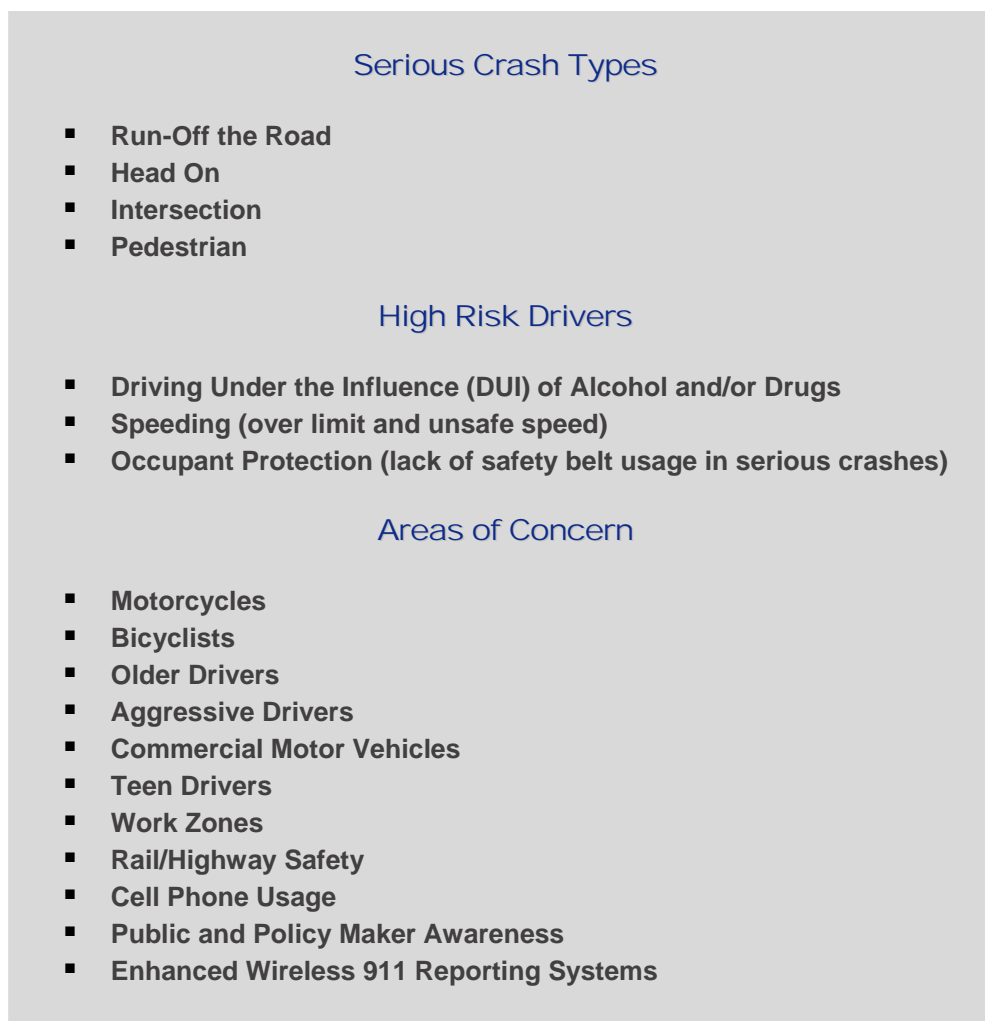
The result of these efforts led to the development of a strategic plan for transportation safety in Texas. As with all plans, changes will need to be made to adapt to future conditions. Therefore, the SHSP is intended to be a "living document" that will evolve as improved crash data and new information on countermeasure effectiveness become available.

RESULTS OF PLANNING PROCESS

Emphasis Areas and Other Areas of Concern

Several key traffic safety issue areas emerged from the analysis and review process. These issues were loosely grouped into two emphasis areas called **Serious Crash Types** and **High Risk Drivers**. Another group of safety issues, not necessarily supported by data analysis, were identified from the consultation process and the review of practices from other states and other documents. These issues are called **Areas of Concern**. All areas are listed in Figure 1.

Figure 1. Emphasis Areas



Safety Issues, Objectives and Countermeasures

The following pages discuss the emphasis areas and safety concerns in detail. Also presented are the crash reduction objectives for each area and countermeasures, where available, that can help to meet those objectives (see Attachment 3 for a summary).

SERIOUS CRASH TYPES

Run Off the Road Crashes

The Issue:

Run off the road (ROR) crashes account for 34.3 percent of the annual fatalities and 22.8 percent of the annual injuries. These casualties resulted primarily from hitting fixed objects and vehicles overturning. An examination of the 40 key crash categories suggests that, as with most crashes, unsafe speed and driving under the influences of alcohol and/or drugs were the dominant contributing factors. Further, in the key crash categories, vehicle overturning tends to occur in rural areas, where fixed object crashes happen in both rural and large urban areas, with the rural crashes being in the majority.

Average Annual Casualties (1997-2001)

Run Off the Road	Fatalities	Serious Injuries	KAB Injuries
All	1,242	24,469	25,711
Hit Fixed Object	787	16,903	17,690
Overturned	409	7,064	7,473

Objective:

Reduce the number of fatal and serious injury crashes involving lane departures on rural and other roads by 10% by 2010, as compared to 2005.

Countermeasures:

- Increase the use of paved shoulders on FM roads to increase the “forgiveness” of the road during inadvertent lane departures.
- Continue to remove trees, relocate utility poles, and protect culverts or remediate risks by other means.
- Continue to install shoulder and centerline rumble strips.
- Install more paved shoulders.
- Continue to install median barriers.
- Increase use of chevron signs at curves.

- Use 30 degree slope or Safety Wedge for pavement edges to facilitate returning to the roadway.
- Use speed activated curve warnings and LED curve displays.
- Use textured pavement for curves with high crash frequency.
- Increase DUI and speed enforcement as a means of reducing run-off the road crashes.
- Ensure that the driver education curriculum includes information concerning curves, curve warnings, and behaviors that lead to ROR crashes.
- Ensure that defensive driving curriculums include information concerning curves, curve warnings, and behaviors that lead to ROR crashes.*
- Reduce EMS response time in rural areas. This could require increasing coverage and/or providing EMS training of volunteers.
- Consider subscriber memberships in rural areas as a means of funding EMS and expanding coverage.
- Move away from parent taught driver education and return to sanctioned, supervised programs with a single curriculum.*
- Consider license re-testing as a means of encouraging drivers to review system requirements and changes.*

*May require legislative action.

Head-On Crashes

The Issue:

Head-on collisions account for 17.8 percent of the annual fatalities and 4.8 percent of the annual injuries. Head-on crashes occur when a vehicle is traveling the wrong way on a one-way route, when a vehicle attempts to pass without sufficient clearance on an undivided route, or when a driver loses control of a vehicle and crosses over into an opposing lane of oncoming traffic. It is highly likely most head-on collisions in recent years have been of the third type. FARS statistics indicate that most head-on crashes result from a motorist making an "unintentional" maneuver – the driver falls asleep, is distracted, or travels too fast in a curve. There may be other contributing factors, such as alcohol use or speeding. According to the 40 key crash categories, head-on collisions described as wrong side, not passing involve vehicle-to-vehicle collisions and tend to occur in rural areas.

Average Annual Casualties (1997-2001)

Head on Crashes	Fatalities	Serious Injuries	KAB Injuries
All	645	5,164	5,809
Wrong Side, Not Passing	251	1,211	1,462

Objective:

Reduce the number of fatal and serious injury head-on crashes on rural roads by 10% by 2010, as compared to 2005.

Countermeasures:

- Install more concrete and cable median barriers.
- Install centerline rumble strips/stripes.
- Widen roadways to increase control and recovery areas.
- Consider the placement of unmanned enforcement vehicles on the approach to curves that have significant crash experience to alert drivers and slow speeds.

Intersection Crashes

The Issue:

Intersection and intersection-related crashes account for 22.5 percent of the annual fatalities and 45.5 percent of the annual injuries. Over 39 percent of these casualties resulted primarily from failure to yield the right of way. The 40 key crash categories suggest that about 45 percent of the failure to yield casualties occur in large urban areas, with about 25 percent occurring in rural and small urban areas.

Average Annual Casualties (1997-2001)

Intersection	Fatalities	Serious Injuries	KAB Injuries
All	815	48,941	49,756
Fail to Yield	300	19,214	19,514

Objective:

Reduce the number of fatal and serious injury intersection-involved crashes by 10% in 2010, as compared to 2005.

Countermeasures:

- Implement engineering solutions to reduce red-light running, such as changes in signal timing.
- More strictly regulate the number and placement of driveways.
- Eliminate more blind spots on high-speed rural roads.
- Add more turn bays and acceleration lanes on high-speed rural roads.
- Enhance advanced warning at intersections.
- Improve signal coordination and timing to control speeds through intersections.
- Expand the use of red-light cameras by municipalities.
- Educate consultants and developers on driveway regulation.
- Add information on gap acceptance and intersection crash frequency to a standardized driver education curriculum.
- Encourage the use of EMS signal preemption.

- Coordinate driveway regulation among city, county and state engineers.

Pedestrian Crashes

The Issue:

Pedestrian and motor vehicle related crashes account for 11.4 percent of the annual fatalities and 2.8 percent of the annual injuries. Although this crash type did not appear in the 40 key crash categories, review of data and comments by safety specialists suggest that a number of these casualties occur in urban areas and involve speeding and impaired drivers. Information suggests that drinking pedestrians contribute to the events.

Average Annual Casualties (1997-2001)

Pedestrian	Fatalities	Serious Injuries	KAB Injuries
All	413	3,001	3,414

Objective:

Reduce the number of fatal and serious injury crashes involving pedestrians and motor vehicles in large urban areas by 10% by 2010, as compared to 2005.

Countermeasures:

- Improve signals, signs and crosswalk markings at intersections.
- Improve pedestrian environments through traffic calming.
- Increase the number of sidewalks and walkways in rural and urban areas.
- Remove impediments to walking on existing sidewalks.
- Increase sight distance to and from intersections and increase lighting at intersections and crosswalks.
- Increase enforcement of pedestrian laws and public intoxication laws in urban and rural areas.
- Develop PI&E materials concerning pedestrian crashes and pedestrian and driver responsibilities.

HIGH RISK DRIVERS

Driving Under the Influence (DUI) of Alcohol and/or Drugs

The Issue:

Crashes in which at least one of the drivers was under the influence of alcohol or drugs resulted in 32.5 percent of the annual fatalities and 13.2 percent of the annual injuries. This contributing factor is found in all crash types and locations. An examination of the 40 key crash categories suggests that over 43 percent of the casualties occur in large urban areas and over 49 percent on rural roads.

Average Annual Casualties (1997-2001)

DUI	Fatalities	Serious Injuries	KAB Injuries
All	1,176	14,146	15,322

Objective:

Reduce the number of fatal and serious injury DUI-involved crashes by 10% by 2010, as compared to 2005.

Countermeasures:

- Increase the use of Selective Traffic Enforcement Programs (STEPs) to deter drunk driving.
- Use sobriety checkpoints.*
- Enforce tougher penalties for drivers convicted of having blood alcohol concentrations of 0.15 or greater.*
- Limit the ability of drivers charged with DUI to plea bargain the charge down to a lesser offense.*
- Increase training to reduce DUI processing time of suspects.
- Increase enforcement of vehicle confiscation law.
- Increase enforcement of Zero Tolerance laws for underage drivers.
- Continue PI&E campaigns to encourage people not to drive impaired.

- Develop bilingual materials for anti-DUI campaigns.
- Educate judges and prosecutors concerning DUI laws.
- Promote alcohol screening in trauma centers and emergency rooms.
- Require all drivers involved in fatal crashes to be tested for alcohol use.*
- Establish minimum sentencing for DUI offenses.*
- Re-evaluate, strengthen and create uniform enforcement of administrative license revocation (ALR) law. *
- Encourage expansion of DWI courts.

Speed Related (over limit or unsafe)

The Issue:

Crashes in which at least one of the drivers was exceeding the speed limit or driving at an unsafe speed resulted in 36 percent of the annual fatalities and 31.7 percent of the annual injuries. This contributing factor is also found in all crash types and locations. An examination of the 40 key crash categories suggests that about 43 percent of the casualties occur in large urban areas and over 45 percent on rural roads.

Average Annual Casualties (1997-2001)

Speed Related	Fatalities	Serious Injuries	KAB Injuries
All	1,305	34,100	35,405

Objective:

Reduce the number of fatal and serious injury speed-related crashes by 10% by 2010, as compared to 2005.

Countermeasures:

- Implement traffic calming (roundabouts, bumps, striping, etc.) in low speed urban areas.

*May require legislative action.

*May require legislative action.

- Reduce speed limits on roads with poor geometrics.
- Increase the use of STEPs to deter speeding on rural roads.
- Continue to use STEPs to deter speeding in large urban areas.
- Implement automated speed enforcement (speed cameras/ photo radar).*
- Enforce CMV truck lane restrictions.
- Develop public support for automated speed enforcement.
- Require tougher penalties for excessive speeding (e.g., 20% or more above the limit).*
- Ban radar detectors.*
- Dedicate a portion of citation revenue back to enforcement efforts (like STEP programs).*

Occupant Protection (lack of safety belt usage in serious crashes)

The Issue:

Although the observed safety belt use rate for drivers and front seat passengers in Texas is over 90 percent, unrestrained occupants represent 36.6 percent of the annual fatalities and 16.5 percent of the annual injuries.

Average Annual Casualties (1997-2001)

Unrestrained	Fatalities	Serious Injuries	KAB Injuries
All	1,325	16,463	17,788
Drivers	817	7,096	7,913
Passengers	508	9,367	9,875

Objective:

Reduce the number of fatal and serious injury crashes involving unrestrained drivers and/or occupants by 10% by 2010, as compared to 2005.

*May require legislative action.

Countermeasures:

- Continue to use STEPs to increase occupant restraint use.
- Increase penalties for occupant protection violations.*
- Continue public information and education (PI&E) campaigns to encourage occupant restraint use.
- Increase the quantity of bilingual educational materials for safety belt and child seat campaigns.
- Increase funding of and participation in community child seat checkup events.
- Require safety belts and child safety seats, as appropriate for all seating positions.*
- Require the use of booster seats for older children.*

*May require legislative action.

SAFETY CONCERNS

Motorcyclists

The Issue:

The proportion of motorcyclists killed in traffic crashes compared to all traffic fatalities almost doubled between 1997 and 2001, increasing from 3.4 percent in 1997 to 6.6 percent in 2001 (motorcyclists currently account for 9 percent of all traffic-related deaths in Texas). That proportion is likely to increase as motorcyclist fatalities and motorcycle registrations in Texas continue to rise.

According to the most recent Texas crash statistics there were 20,768 motorcycle-involved crashes between 1997 and 2001. The number of crashes involving motorcycles increased by 58 percent, while the number of motorcycle fatalities increased by 108 percent over the 5-year period. The total number of injuries received in motorcycle crashes increased by 74 percent over the 5-year period, from 3,375 in 1997 to 5,896 in 2001. Texas' fatality and injury rates per 10,000 registered motorcycles also increased significantly over the 5-year period.

Average Annual Casualties (1997-2001)

Motorcyclist	Fatalities	Serious Injuries	KAB Injuries
All	187	3,179	3,366

Objective:

Reduce the number of fatal and serious injury crashes involving motorcycles by 10% by 2010, as compared to 2005.

Countermeasures:

- Target enforcement on specific motorcycle/motorist behaviors.
- Increase reporting of alcohol involvement in motorcycle crashes.
- Train law enforcement in the detection of impaired riders.
- Increase helmet and protective gear usage through education.

- Create education programs that address specific behaviors of motorcyclists.
- Conduct PI&E campaigns to increase motorist awareness of motorcycles.
- Increase participation in rider education and training programs.
- Increase participation of EMS personnel in helmet use advocacy.
- Require the use of motorcycle helmets for all riders.*

Bicyclists

The Issue:

Crashes involving bicycles account for 1.3 percent of the annual fatalities and 1.4 percent of the annual injuries. National trends show that the 14 years and under age group accounted for 18 percent of all bicycle-related fatalities and 29 percent of all bicycle-related injuries. Because of the number of bicycle riders and the predominance of young riders, NHTSA has several initiatives addressing bicycle safety.

Average Annual Casualties (1997-2001)

Bicyclist	Fatalities	Serious Injuries	KAB Injuries
All	48	1,531	1,579

Objective:

Reduce the number of fatal and serious injury crashes involving bicycles by 10% by 2010, as compared to 2005.

Countermeasures:

- Implement a comprehensive Safe Routes to School program.
- Integrate bicycles into transportation system (improve connectivity).
- Increase enforcement of bicycle right-of-way traffic laws.

*May require legislative action.

- Conduct bicycle training programs for school age children.
 - Increase motorist awareness of bicycles: "share the road".
 - Conduct PI&E campaign on the use of bicycle safety equipment.
 - Increase participation of EMS personnel in helmet and other safety equipment use advocacy.
 - Encourage local ordinances regarding bicycle helmet use.
- Provide vouchers and/or alternative transportation options.

Older Drivers

The Issue:

Crashes involving at least one driver who is 65 years of age or older result in 13.9 percent of the annual fatalities and 10.9 percent of the annual injuries. AASHTO has identified crashes involving older drivers as one of their emphasis areas.

Average Annual Casualties (1997-2001)

Drivers 65+	Fatalities	Serious Injuries	KAB Injuries
All	505	11,766	3,473

Objective:

Reduce the number of fatal and serious injury crashes involving older drivers by 10% by 2010, as compared to 2005.

Countermeasures:

- Improve signing and modify traffic control devices to accommodate older drivers.
- Improve driving competency of older adults by offering training programs.
- Communicate driving and licensing issues to older driver/family.
- Develop community mobility resource guide.
- Use of law enforcement contacts as a means of distributing information on testing/licensing/social services.
- Enlist the aid of the medical community as a resource to distribute materials concerning, and of benefit to older drivers.

Aggressive Driving

The Issue:

NHTSA has defined aggressive driving as a combination of moving traffic offenses that endanger other drivers or property. Crashes related to aggressive driving generally involve combinations of contributing factors such as speeding, reckless driving, following too close, illegal lane changes, etc. At present, the Texas crash data system does not record reckless driving as a contributing factor and many of the others may not be recorded. Consequently, crashes involving aggressive drivers are difficult to identify. However, both NHTSA and AASHTO have initiatives addressing aggressive driving behavior.

Objective:

Reduce the number of fatal and serious injury crashes involving aggressive driving by 10% by 2010, as compared to 2005.

Countermeasures:

- Define aggressive driving for purposes of classifying crashes.
- Train law enforcement to recognize aggressive driving behaviors.
- Increase high visibility enforcement.
- Increase coordinated enforcement of aggressive driving.
- Enhance penalties for aggressive driving.*
- Conduct PI&E campaigns about aggressive driving and basic tips for dealing with an aggressive driver.
- Educate aggressive drivers to remediate behaviors.

*May require legislative action.

Commercial Motor Vehicles

The Issue:

Crashes involving commercial motor vehicles result in 24.5 percent of the annual fatalities and 21.2 percent of the annual injuries. Because of the stiffness, size and weight of large trucks, crashes that they are involved in tend to be severe. For this reason, AASHTO has designated heavy trucks as an emphasis area.

Average Annual Casualties (1997-2001)

Commercial Vehicles	Fatalities	Serious Injuries	KAB Injuries
All	877	22,516	23,393

Objective:

Reduce the number of fatal and serious injury crashes involving commercial motor vehicles by 10% by 2010, as compared to 2005.

Countermeasures:

- Reduce driver fatigue-related crashes by providing center and shoulder rumble strips and truck parking areas.
- Increase use of lane restrictions.
- Increase enforcement of commercial motor vehicle speed limits.
- Increase inspections of trucks for safety equipment and violations.
- Increase public knowledge about sharing the road.
- Conduct PI&E campaigns on vehicle limitations, rules, crash experience and restrictions.
- Coordinate with Department of Homeland Security (DHS) for funding inspection stations/manpower to staff.

Teen Drivers

The Issue:

Drivers under the age of 19 represent only 5.7 percent of the licensed drivers in Texas but are involved in 17.8 percent of the average annual fatalities and 24.7 percent of the average annual serious injuries. AASHTO and NHTSA have identified crashes involving young drivers as an emphasis area.

Average Annual Casualties (1997-2001)

Teen Drivers (15-19 years of age)	Fatalities	Serious Injuries	KAB Injuries
All	646	21,377	22,023

Objective:

Reduce the number of fatal and serious injury crashes involving teen drivers by 10% by 2010, as compared to 2005.

Countermeasures:

- Conduct teen driver education programs in schools.
- Reconsider driver education policies, particularly parent-taught programs.*
- Evaluate the effectiveness of graduated licensing and alter as necessary.*

*May require legislative action.

Work Zones

The Issue:

Work zone and work zone-related crashes result in 4.2 percent of the average annual fatalities and 3.9 percent of the average annual serious injuries. AASHTO has identified work zone crashes as an emphasis area.

Average Annual Casualties (1997-2001)

Work Zones	Fatalities	Serious Injuries	KAB Injuries
All	154	4,158	4,311

Objective:

Reduce the number of fatal and serious injury crashes related to work zones by 10% by 2010, as compared to 2005.

Countermeasures:

- Reduce the number, duration and impact of work zones.
- Improve work zone traffic control devices.
- Improve work zone design practices.
- Improve driver compliance with work zone traffic controls.
- Increase knowledge and awareness of work zones.
- Develop procedures to effectively manage work zones.

Rail/Highway Safety

The Issue:

Railroad grade crossing crashes have been addressed by closing those crossing that are unnecessary and by up grading signals at crossings that experience increases in traffic volumes.

Objective:

Continue the current railroad grade crossing improvement program.

Countermeasures:

- Target high incident crossings for elimination.
- Continue to install warning lights and gates at public road grade crossings.

Cell Phone Usage

The Issue:

Cell phone usage has been given as a contributing factor in crashes in a number of research studies sponsored by the NHTSA. The issue seems to be related to the distraction posed by involved conversations rather than by the act of dialing. Currently, Texas has cell phone usage as a contributing factor on its crash report form. However, there is little or no automated crash data available after this factor was added.

Objective:

Determine the relationship between cell phone use and crashes. If a direct relationship exists, reduce the incidence of cell phone use by drivers by 25% by 2010 as compared to 2008.

Countermeasures:

- Train police officers to investigate and record cell phone usage as a contributing crash factor.
- Institute penalties for drivers using cell phones while their vehicle is moving.*

*May require legislative action.

Public and Policy Maker Awareness

The Issue:

The stakeholder survey revealed that many of the respondents did not know how effective many of the countermeasures were and/or whether or not they were being implemented appropriately in Texas. For example, from a quarter to a third of the respondents did not know whether speed and DWI STEPs were effective. While this number fell for safety belt use STEPs, almost 20 percent were uncertain whether these were effective, too.

If traffic safety experts and advocates are this uncertain about the effectiveness of STEPs, it is hard to build public or policymaker support for this countermeasure. The same can be said for most of the other countermeasures in the survey, with the notable exceptions of shoulder rumble strips and median barriers (only 5 percent "don't know").

Objective:

Increase public and policymaker awareness of what countermeasures work to gain greater implementation of these measures.

Countermeasures:

- Conduct PI&E campaigns to increase awareness of traffic safety issues.
- Conduct traffic safety seminars for transportation officials.
- Develop traffic safety "white papers" for policymakers.

Enhanced Wireless 911

The Issue:

Phase II Enhanced 911 wireless services allow Public Service Answering Points (PSAPs) to identify the location of a person making an emergency call from a cell phone or other wireless communications device. The ability to locate the caller is especially critical in life-threatening events such as serious traffic crashes. Nationally, about a third of all 911 calls are made from wireless phones, with many of these calls being ones to report traffic crashes.

Texas currently has one of the lowest rates of implementation of E911 services in the country, with only 19 percent of counties so equipped as of March, 2006. However, according to an article in the *Houston Chronicle* on April 23, 2006, funds have been collected from a telephone tax to pay for such services and 82 million of the funds collected remain unspent.

Also, according to a March, 2006 study by the Government Accountability Office, Texas reports that it will take more than five years for all PSAPs in the state to have E911 capabilities.

Objective:

Provide Phase II Enhanced 911 (E911) wireless services in all Texas counties by 2010.

Countermeasures:

- Increase the rate at which E911 is being implemented.

FUTURE PLANNING

Preliminary Plan

This plan represents the *preliminary* effort in developing a comprehensive process for focusing attention on transportation safety issues in the state. It is the first step in organizing the various interests in the transportation system, each of which may have its own safety plan or may have programs that involve safety components. It is *preliminary* in the sense that the process for accommodating these agencies and integrating their plans and interests is evolving and will continue to evolve. It must also be considered *preliminary* because the crash data, which provide the foundation of the safety planning process, are limited in timeliness and/or level of detail. Finally, it must be considered *preliminary* because, even though this planning process identified issue areas and countermeasures to address those areas, responsibility and resources necessary for countermeasure implementation have yet to be developed. Although a detailed implementation plan is not usually part of strategic planning, it is anticipated that future efforts will include a general reference to potential funding and agency program responsibilities.

Evaluation

The preliminary nature notwithstanding, the plan does begin the process. The next phase of the process is the evaluation of progress. Three types of evaluations are anticipated. First, and perhaps more important at this stage, is an evaluation of the process itself.

Second, because nominal crash reduction objectives and statewide crash reduction goals were established as part of the planning process, they, too, must be evaluated. Given that these goals were developed using old and limited data, the efficacy of the goals must be evaluated in conjunction with progress toward goal achievement.

Finally, the planning process identified countermeasure efforts that, if implemented in strength, were thought to have potential for reducing crash experience. These anticipated crash reductions were directly related to goals established. An administrative evaluation will be conducted to assess efforts in countermeasure implementation.

Revision of Strategic Plan

The culmination of the three levels of evaluation will be an improved process for revising the Strategic Highway Safety Plan. The revised plan will use more current crash data to establish countermeasure emphasis areas and program goals. It will also recommend specific countermeasures that will address the emphasis areas. Further, it will suggest, where appropriate, methods for improving the efficiency of the countermeasures recommended. Finally, it will recommend changes in the planning process.

Attachment 1

The 40 Key Crash Categories

The focus of the analysis of crash data was on **where** crash casualties occur (e.g., rural areas, large/small urban areas, interstate highways, city streets, etc.) **how** they occur (e.g., multi-vehicle, non-collision overturn, collision with fixed objects) and **what** types of crashes result in casualties (crashes related to speeding, DUI, failure to yield right of way, etc. The basic units of analysis are the frequency of K, A and B-level casualties¹ sustained in crashes and the same frequencies weighted by estimated economic loss associated with those casualties

Table 1. The 40 Key KAB Crash Categories

Population Group	Road Class	Most Frequent First Harmful Event	Most Frequent Contributing Factor	Freq KAB Injuries	KAB Injuries Economic Loss*	Freq Rank	Loss Rank	Cumulative Economic Loss	Cumulative % of Total Loss
Large Urban	City Streets	Collision with Other Vehicle	Fail Yield ROW	7,625.6	234,788,400	1	1	234,788,400	4.3%
Rural	US/TX	Collision with Other Vehicle	Fail Yield ROW	3,012.0	219,836,320	4	2	454,624,720	8.4%
Rural	US/TX	Collision with Other Vehicle	DUI-Under Inf Alcohol	1,085.4	207,031,080	17	3	661,655,800	12.2%
Rural	US/TX	Collision with Other Vehicle	Speed Unsafe	2,347.4	171,414,780	7	4	833,070,580	15.4%
Small/mid-size Urban	US/TX	Collision with Other Vehicle	Fail Yield ROW	3,444.2	144,368,020	3	5	977,438,600	18.0%
Rural	US/TX	Collision with Other Vehicle	Wrong side, not passing	463.6	136,279,680	42	6	1,113,718,280	20.5%
Large Urban	City Streets	Collision with Other Vehicle	Stop sign/signal viol.	3,660.6	122,826,240	2	7	1,236,544,520	22.8%
Rural	FM	Collision with Other Vehicle	Fail Yield ROW	1,431.2	88,902,200	13	8	1,325,446,720	24.4%
Large Urban	City Streets	Collision with Other Vehicle	Speed Unsafe	2,852.4	87,678,440	6	9	1,413,125,160	26.0%
Rural	US/TX	Collision with Fixed Object	DUI-Under Inf Alcohol	676.2	86,802,480	27	10	1,499,927,640	27.6%
Small/mid-size Urban	City Streets	Collision with Other Vehicle	Fail Yield ROW	2,856.4	86,031,720	5	11	1,585,959,360	29.2%
Large Urban	City Streets	Collision with Other Vehicle	DUI-Under Inf Alcohol	1,337.4	85,318,460	15	12	1,671,277,820	30.8%
Rural	FM	Collision with Other Vehicle	DUI-Under Inf Alcohol	569.2	80,646,960	37	13	1,751,924,780	32.3%
Large Urban	US/TX	Collision with Other Vehicle	Stop sign/signal viol.	1,844.6	75,081,380	11	14	1,827,006,160	33.7%
Small/mid-size Urban	US/TX	Collision with Other Vehicle	Speed Unsafe	2,110.2	74,569,020	8	15	1,901,575,180	35.1%
Large Urban	US/TX	Collision with Other Vehicle	Fail Yield ROW	1,900.0	74,481,540	9	16	1,976,056,720	36.4%
Large Urban	Interstates	Collision with Other Vehicle	Speed Unsafe	1,852.6	69,473,920	10	17	2,045,530,640	37.7%
Large Urban	US/TX	Collision with Other Vehicle	DUI-Under Inf Alcohol	809.8	65,003,500	24	18	2,110,534,140	38.9%
Rural	US/TX	Non-collision Overturn	DUI-Under Inf Alcohol	445.4	63,754,260	44	19	2,174,288,400	40.1%

¹The use of casualties rather crashes does not materially affect the overall ranking of crash problems and provides for more accurate estimates of severity of crashes by accounting for multiple injuries sustained in individual crashes (see attachment 1).

Table 1. The 40 Key KAB Crash Categories

Population Group	Road Class	Most Frequent First Harmful Event	Most Frequent Contributing Factor	Freq KAB Injuries	KAB Injuries Economic Loss*	Freq Rank	Loss Rank	Cumulative Economic Loss	Cumulative % of Total Loss
Rural	FM	Collision with Fixed Object	DUI-Under Inf Alcohol	557.4	63,520,300	38	20	2,237,808,700	41.2%
Small/mid-size Urban	US/TX	Collision with Other Vehicle	Stop sign/signal viol.	1,410.0	62,595,340	14	21	2,300,404,040	42.4%
Rural	US/TX	Collision with Other Vehicle	DUI & Wrong side, not pass	194.4	62,389,240	77	22	2,362,793,280	43.6%
Rural	FM	Collision with Other Vehicle	Speed Unsafe	1,075.0	61,377,200	18	23	2,424,170,480	44.7%
Large Urban	City Streets	Collision with Fixed Object	DUI-Under Inf Alcohol	740.6	59,222,760	25	24	2,483,393,240	45.8%
Large Urban	US/TX	Collision with Other Vehicle	Speed Unsafe	1,664.0	56,657,180	12	25	2,540,050,420	46.8%
Rural	US/TX	Collision with Other Vehicle	Stop sign/signal viol.	581.2	55,504,760	36	26	2,595,555,180	47.8%
Rural	FM	Non-collision Overturn	DUI-Under Inf Alcohol	340.6	54,968,520	49	27	2,650,523,700	48.9%
Small/mid-size Urban	US/TX	Collision with Other Vehicle	DUI-Under Inf Alcohol	596.2	51,587,540	35	28	2,702,111,240	49.8%
Rural	County Rds	Collision with Fixed Object	DUI-Under Inf Alcohol	596.6	50,833,860	34	29	2,752,945,100	50.7%
Rural	Interstates	Collision with Other Vehicle	Speed Unsafe	669.4	49,877,160	30	30	2,802,822,260	51.7%
Large Urban	City Streets	Collision with Fixed Object	Speed Unsafe	986.4	48,275,780	20	31	2,851,098,040	52.6%
Rural	FM	Non-collision Overturn	Speed Unsafe	665.0	48,267,380	32	32	2,899,365,420	53.4%
Rural	US/TX	Collision with Fixed Object	Speed Unsafe	675.8	48,156,080	28	33	2,947,521,500	54.3%
Large Urban	Interstates	Collision with Fixed Object	DUI-Under Inf Alcohol	370.2	47,830,840	48	34	2,995,352,340	55.2%
Rural	FM	Collision with Other Vehicle	Wrong side, not passing	255.4	47,215,740	65	35	3,042,568,080	56.1%
Rural	FM	Collision with Fixed Object	Speed Unsafe	668.2	46,503,960	31	36	3,089,072,040	56.9%
Rural	County Rds	Collision with Fixed Object	Speed Unsafe	1,012.4	45,973,820	19	37	3,135,045,860	57.8%
Rural	County Rds	Collision with Other Vehicle	Fail Yield ROW	1,090.2	44,190,600	16	38	3,179,236,460	58.6%
Large Urban	Interstates	Collision with Other Vehicle	DUI-Under Inf Alcohol	540.2	42,557,580	39	39	3,221,794,040	59.4%
Rural	US/TX	Non-collision Overturn	Speed Unsafe	671.8	40,278,100	29	40	3,262,072,140	60.1%
Total				55,685.2	3,262,072,140			3,262,072,140	60.1%

*In Dollars

Texas SHSP Participant List

- AAA Texas
- Associated General Contractors of Texas
- ATTSA
- Burlington Northern Santa Fe Railroad
- City of Dallas Transportation Management systems
- City of Houston
- Department of State Health Services
- Federal Motor Carrier Safety Administration
- Federal Highway Administration
- Houston-Galveston Area Council
- Injury Prevention Center of Greater Dallas
- Lower Rio Grande Valley Development Council
- MADD Texas
- Methodist Hospital
- National Highway Traffic Safety Administration
- Sam Houston State University
- Sheriffs' Association of Texas
- Sherry Matthews Advocacy Marketing
- Texas Alcoholic Beverage Commission
- Texas Association of Business
- Texas Association of Counties
- Texas Bicycle Coalition
- Texas Center for Judiciary
- Texas Cooperative Extension
- Texas Department of Public Safety
- Texas Department of State Health Services
- Texas Department of Transportation
- Texas District & County Attorneys Association
- Texas Good Roads/Transportation Association
- Texas Engineering Extension Service
- Texas Motor Transportation Association
- Texas Municipal Court Association
- Texas Municipal Police Association
- Texas Operation Lifesaver
- Texas Police Chiefs Association
- Texas Tech University
- Texas Transportation Institute
- Trans Texas Alliance
- University of Houston
- University of Texas Health Sciences Center - San Antonio
- University of Texas - Austin
- University of Texas - Arlington

Attachment 3

Summary of SHSP Recommended Countermeasures

SERIOUS CRASH TYPES	Engineering	Enforcement	Education	EMS	Public Policy and Other
Run-Off the Road (ROR) Crashes – Crashes with Fixed Objects – Rollover Crashes	<p>Increase the use of paved shoulders on FM roads to increase the "forgiveness" of the road during lane departures.</p> <p>Continue to remove trees, relocate utility poles, and protect culverts or remediate risks by other means.</p> <p>Continue to install shoulder and centerline rumble strips.</p> <p>Install more improved shoulders.</p> <p>Continue to install median barriers.</p> <p>Increase and improve use of chevron signs at curves.</p> <p>Use 30 degree slope or Safety Wedge for pavement edges to facilitate returning to the roadway.</p> <p>Use speed activated curve warnings and LED curve displays.</p> <p>Use textured pavement for curves with high crash frequency.</p>	<p>Increase DUI and speed enforcement as a means of reducing run-off the road crashes.</p>	<p>Ensure that driver education curriculums include information concerning curves, curve warnings, and behaviors that lead to ROR crashes.</p> <p>Ensure that defensive driving curriculums include information concerning curves, curve warnings, and behaviors that lead to ROR crashes.</p>	<p>Reduce EMS response time in rural areas. This could require increasing coverage and/or providing EMS training of volunteers.</p> <p>Consider subscriber memberships in rural areas as a means of funding EMS and expanding coverage.</p>	<p>Move away from parent taught driver education and return to sanctioned, supervised programs with a single curriculum.*</p> <p>Consider license re-testing as a means of encouraging drivers to review system requirements and changes.*</p>

*May require legislative action.

SERIOUS CRASH TYPES	Engineering	Enforcement	Education	EMS	Public Policy and Other
Head-On Crashes – Wrong Side-Not Passing	Install more concrete and cable median barriers. Install centerline rumble strips/stripes. Widen roadways to increase control and recovery areas.	Consider the placement of unmanned enforcement vehicles on the approach to curves that have a significant crash experience to alert drivers and slow speeds.			
Intersection Crashes – Fail to Yield Right of Way	Implement engineering solutions to reduce red-light running, such as changes in signal timing. More strictly regulate the number and placement of driveways. Eliminate more blind spots at intersections on high-speed rural roads. Add more turn bays and acceleration lanes on high-speed rural roads. Enhance advanced warning at intersections. Improve signal coordination and timing to control speeds through intersections.	Expand the use of red-light cameras by municipalities.	Educate consultants and developers on driveway regulation. Add information on gap acceptance and intersection crash frequency to a standardized driver education curriculum.	Encourage the use of EMS signal preemption.	Coordinate driveway regulation among city, county and state engineers.

*May require legislative action.

SERIOUS CRASH TYPES	Engineering	Enforcement	Education	EMS	Public Policy and Other
Pedestrian Crashes	<p>Improve signals, signs and crosswalk markings at intersections.</p> <p>Improve pedestrian environments through traffic calming.</p> <p>Increase the number of sidewalks and walkways in rural and urban areas.</p> <p>Remove impediments to walking on existing sidewalks.</p> <p>Increase sight distance to and from intersections and increase lighting at intersections and crosswalks.</p>	<p>Increase enforcement of pedestrian laws and public intoxication laws in urban and rural areas.</p>	<p>Develop PI&E materials concerning pedestrian crashes and pedestrian and driver responsibilities.</p>		

*May require legislative action.

HIGH RISK DRIVERS	Engineering	Enforcement	Education	EMS	Public Policy and Other
Driving Under the Influence (Drugs and Alcohol)		<p>Increase the use of STEPs to deter drinking and driving.</p> <p>Use of sobriety checkpoints.*</p> <p>Enforce tougher penalties for drivers convicted of having blood alcohol concentrations of 0.15 or greater.*</p> <p>Limit the ability of drivers charged with DUI to plea bargain the charge down to a lesser offense.</p> <p>Increase training to reduce processing time of DUI suspects.</p> <p>Increase enforcement of vehicle confiscation law.</p> <p>Increase enforcement of Zero Tolerance laws for underage drivers.</p>	<p>Continue PI&E campaigns to encourage people not to drive impaired.</p> <p>Develop bilingual materials for anti-DUI campaigns.</p> <p>Educate judges and prosecutors concerning DUI laws.</p>	<p>Promote alcohol screening in trauma centers and emergency rooms.</p>	<p>Require all drivers involved in fatal crashes to be tested for alcohol use.*</p> <p>Establish minimum sentencing for DUI offenses.*</p> <p>Re-evaluate, strengthen and create uniform enforcement of administrative license revocation (ALR) law.*</p> <p>Encourage expansion of DWI courts.</p>

*May require legislative action.

HIGH RISK DRIVERS	Engineering	Enforcement	Education	EMS	Public Policy and Other
Speed Related (Over Limit and Unsafe)	<p>Implement traffic calming (roundabouts, bumps, striping, etc.) in urban areas.</p> <p>Reduce speed limits on roads with poor geometrics.</p>	<p>Increase the use of STEPs to deter speeding on rural roads.</p> <p>Continue to use STEPs to deter speeding in large urban areas.</p> <p>Implement automated speed enforcement (speed cameras/photo radar).*</p> <p>Enforce commercial motor vehicle truck lane restrictions.</p>	<p>Develop public support for automated speed enforcement.</p>		<p>Require tougher penalties for excessive speeding.*</p> <p>Ban radar detectors.*</p> <p>Dedicate a portion of citation revenue back to enforcement efforts (like STEP programs).*</p>
Occupant Protection – Lack of Seat Belt Usage in Serious Crashes		<p>Continue to use STEPs to increase occupant restraint use.</p> <p>Increase penalties for occupant protection violations.*</p>	<p>Continue PI&E campaigns to encourage occupant restraint use.</p> <p>Increase the quantity of bilingual educational materials for safety belt and child seat campaigns.</p> <p>Increase funding of and participation in community child seat check-up events.</p>		<p>Require safety belt and child safety seats, as appropriate for all seating positions.*</p> <p>Require the use of booster seats for older children.*</p>

*May require legislative action.

OTHER SAFETY CONCERNS	Engineering	Enforcement	Education	EMS	Public Policy and Other
Motorcyclists		<p>Target enforcement on specific motorcycle/motorist behaviors.</p> <p>Increase reporting of alcohol involvement in motorcycle crashes.</p>	<p>Train police officers in the detection of impaired riders.</p> <p>Increase helmet and protective gear usage through education.</p> <p>Create education programs that address specific behaviors of motorcyclists.</p> <p>Conduct PI&E campaigns to increase motorist awareness of motorcycles.</p> <p>Increase participation in rider education and training programs.</p>	<p>Increase participation of EMS personnel in helmet use advocacy.</p>	<p>Require the use of motorcycle helmets for all riders.*</p>
Bicyclists	<p>Implement comprehensive Safe Routes to School program.</p> <p>Integrate bicycles into the transportation system (improve connectivity).</p>	<p>Increase enforcement of bicycle right-of-way traffic laws.</p>	<p>Conduct bicycle training programs for school age children.</p> <p>Increase motorist awareness of bicycles: "share the road".</p> <p>Conduct PI&E campaign on use of bicycle safety equipment.</p>	<p>Increase participation of EMS personnel in helmet and other safety equipment use advocacy.</p>	<p>Encourage local ordinances regarding bicycle helmet use.</p>

*May require legislative action.

OTHER SAFETY CONCERNS	Engineering	Enforcement	Education	EMS	Public Policy and Other
Older Drivers	Improve signing and modify traffic control devices to accommodate older drivers.		<p>Improve driving competency of older adults by offering training programs.</p> <p>Communicate driving and licensing issues to older driver/family.</p> <p>Develop community mobility resource guide.</p> <p>Use of law enforcement contacts as a means of distributing information on testing/licensing/social services.</p>	Enlist the aid of the medical community as a resource to distribute materials concerning, and of benefit to older drivers.	Provide vouchers and/or alternative transportation options.
Aggressive Drivers		<p>Train law enforcement to recognize aggressive driving behaviors.</p> <p>Increase high visibility enforcement.</p> <p>Increase coordinated enforcement of aggressive driving.</p>	<p>Conduct PI&E campaigns about aggressive driving and basic tips for dealing with an aggressive driver.</p> <p>Educate aggressive drivers to remediate behavior.</p>		<p>Define aggressive driving for purposes of classifying crashes.</p> <p>Enhance penalties for aggressive driving.*</p>
Commercial Motor Vehicles	Reduce driver fatigue-related crashes by providing center and shoulder rumble strips and truck parking areas.	<p>Increase use of lane restrictions.</p> <p>Increase enforcement of CMV speed limits.</p> <p>Increase inspections of trucks for safety equipment and violations.</p>	<p>Increase public knowledge about sharing the road.</p> <p>Conduct PI&E campaigns on vehicle limitations, rules, crash experience and restrictions.</p>		Coordinate with Department of Homeland Security for funding inspection stations/personnel to staff.

*May require legislative action.

OTHER SAFETY CONCERNS	Engineering	Enforcement	Education	EMS	Public Policy and Other
Teen Drivers			Conduct teen driver education programs in schools.		Reconsider driver education policies particularly parent-taught programs.* Evaluate the effectiveness of graduated licensing and alter as necessary.
Work Zones	Reduce the number, duration, and impact of work zones. Improve work zone traffic control devices. Improve work zone design practices.	Improve driver compliance with work zone traffic controls.	Increase knowledge and awareness of work zones.		Develop procedures to effectively manage work zones.
Rail/Highway Safety	Target high incident crossings for elimination. Continue to install warning lights and gates at public road grade crossings.				
Cell Phone Usage			Train police officers to investigate and record cell phone usage as a contributing factor in crashes.		Institute penalties for drivers using cell phones while their vehicle is moving.*

*May require legislative action.

OTHER SAFETY CONCERNS	Engineering	Enforcement	Education	EMS	Public Policy and Other
Public and Policy Maker Awareness			Conduct PI&E campaigns to increase awareness of traffic safety issues. Conduct safety seminars for transportation officials. Develop traffic safety "white papers" for policy makers.		
Enhanced Wireless 911					Increase rate at which E911 is being implemented.

*May require legislative action.